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ABSTRACT

This study compared the relative effects of three kindergarten schedules on children's achievement in reading, writing, and mathematics, and on children's prosocial classroom behaviors. Participating were 47 children attending all-day kindergarten, 56 attending alternate-day kindergarten, and 44 attending half-day kindergarten. Individual achievement tests were administered in a pretest-posttest procedure. Analysis of covariance showed that the all-day kindergarten group scored significantly higher in reading, with no significant differences in mathematics or writing. Multivariate analysis of covariance for the 14 subscales of classroom social behaviors on the Hahnemann Elementary Behavior Rating Scale showed significant differences between groups, with the half-day children exhibiting higher scores on classroom behaviors that facilitate learning and lower scores on negative behaviors. Possible reasons for these differences and implications of developmentally appropriate practices, teachers' theoretical orientation to reading instruction, and parent survey information were explored. (Contains 29 references.) (Author/KB)

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Effects Of *All-Day*, And *Half-Day* Kindergarten Programming On Reading, Writing, Math, And Classroom Social Behaviors

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Abstract

A study was conducted to compare the relative effects of three different kindergarten schedules on children's achievement in reading, writing, and math and prosocial classroom behaviors. Subjects included 47 children attending *all-day* kindergarten, 56 children attending *alternate- day* kindergarten, and 44 children attending *half-day* kindergarten. Individual achievement tests were administered in a pre-posttest procedure. Analysis of covariance showed the *all-day* kindergarten group scored significantly higher in reading, with no significant differences in math and writing. Multivariate analysis of covariance for the 14 subscales of classroom social behaviors on the Hahnemann Elementary Behavior Rating Scale (HEBS) (Spivak & Swift, 1975) showed significant differences between groups, with the *half-day* children exhibiting higher scores on classroom behaviors that facilitate learning and lower scores on negative behaviors. Possible reasons for these differences and implications of developmentally appropriate practices, teachers' theoretical orientation to reading instruction, and parent survey information are discussed.

Changing economic and social conditions has caused many school districts to modify kindergarten programming. Teachers, parents, administrators, and school boards are challenged with meeting the physical, social, and cognitive needs of five-year-olds amid the realities of diminishing fiscal resources and the need for all-day professional child care. These pragmatic factors have led educators to seek empirical evidence to guide kindergarten decision making. The studies that presently exist fail to directly compare the relative effects of all three kindergarten schedules—all-day, every day; half-day, every day; and all-day, alternate days (hereafter referred to as *all-day* , *half-day* , and *alternate-day* , respectively)–on the same variables.

The purpose of this quasi-experimental study was to use multiple data collection techniques to compare academic achievement and prosocial classroom behaviors of children attending *all-day, alternate-day,* and *half-day* kindergarten programs. The children were administered individual standardized reading and math assessments in a pre-post procedure. Writing development was assessed using an informal instrument individually administered in the fall and spring. Kindergarten teachers evaluated individual classroom social behaviors using a standardized rating scale. Teachers' theoretical orientation to reading instruction was assessed. A questionnaire distributed by kindergarten teachers at parent-teacher conferences was used to survey parents' literacy backgrounds and behaviors. The level of use of developmentally appropriate practices was measured using an informal classroom observational rating scale developed from the Nebraska Kindergarten Paper (1984) and consistent with the National Association for the Education of Young Children's (NAEYC) guidelines (Bredekamp, 1987).

In the past, the primary concern in kindergarten programming change has been to ensure that children continue to receive the same number of contact hours each year. On the basis of reviews and critiques of kindergarten programming research (Jalongo, 1986; Karweit, 1987; Puleo, 1988), it was predicted that the *quantity* of time children spent in school would be far less significant than the *quality* of the kindergarten experience. It was further hypothesized that assessing the level of developmentally appropriate classroom practices, teachers' theoretical orientation to reading instruction, early child care and educational experiences of children and the literacy contributions of parents would provide a lens to see what good instructional practice can look like in a nurturing kindergarten learning environment that is academic in a more appropriate way than traditional instruction.

A review of the literature revealed that this study established bench marks for kindergarten programming research not met to date by other published studies. This study, conducted within one school district using a common kindergarten curriculum, used individually administered standardized assessments in a pre-posttest procedure to compare the relative effects of three different kindergarten schedules (*all-day, alternate-day,* and *half-day*) on children's cognitive and social performance. The formal measures were substantiated with informal assessment data providing a comprehensive overview of the whole child.

Research Favoring *Half-Day* Kindergarten Programs

Few research studies demonstrate superiority of the *half-day* schedule over other programs (Gullo, Bersani, Clements, & Bayless, 1986). Pigge (1979) reported that children attending the *half-day* schedule scored significantly higher on the Metropolitan Reading Readiness Test than statistically matched peers in an *alternate-day* program. Wenger (1978), in one of the only kindergarten programming studies utilizing pre-post data, reported that the morning *half-day* group scored significantly higher than the afternoon *half-day* group or the *alternate-day* group on the Walker Readiness Test.

Research Favoring *Alternate-Day* Kindergarten Programs

In recent years, school districts that have modified the traditional kindergarten program to an *all-day, alternate-day* schedule have done so in an effort to save on transportation costs (fuel and drivers' salaries) and to avoid complicated transportation

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schedules (Minnesota State Department of Education, 1972; Cleminshaw & Guidubaldi, 1979; Ulrey, Alexander, Bender, & Gillis, 1982). Research studies have generally shown that *alternate-day* programming is at least as academically effective as *half-day* schedules (Cleminshaw & Guidubaldi, 1979; Gomowich, Volker, & Landry, 1974; Gullo et al., 1986; Gullo & Clements, 1984; Minnesota State Department of Education, 1972; Mouw, 1976; Schulz, 1981; Smith, 1980; Ulrey et al., 1982). Gornowich et al. (1974) conducted a study involving 787 kindergarten students over a four-year period. Data were collected from *half-day* programming the first three years and *alternate-day* schedules the fourth year. Scores on the Metropolitan Reading Readiness Test indicated significant differences favoring the *alternate-day* group. Cleminshaw and Guidubaldi (1979) compared the relative effects of *half-day* and *alternate-day* kindergarten schedules on children's academic skills and social competency. They reported significant differences favoring the *alternate-day* children in academic skills as measured by the Metropolitan Reading Readiness Test and in social competency as measured by the Kuhn Social Competence Scale. In a longitudinal study of the effects of *alternate-day* and *half-day* kindergarten programming on academic and affective variables, Smith (1980) found that *alternate-day* children scored significantly higher on the Metropolitan Reading Readiness Test and on two affective variables—social maturity and self-security—using the Self-Observation Scale. No significant differences were found between the *half-day* and *alternate-day* kindergarten groups on any variables at the fourth grade level. Gullo et al. (1986) reported that children from *alternate-day* kindergarten schedules were rated significantly lower by their teachers on negative social behavior factors than children from *all-day* and *half-day* kindergarten programming on the Hahnemann Elementary School Behavior Rating Scale.

Research Favoring *All-Day* Kindergarten Programs

Three reviews synthesizing the comparison research regarding *all-day* kindergarten programs found the effect of *all-day* kindergarten programming on basic academic skills to be positive (Karweit, 1987; Puleo, 1988 Stinard, 1982). In a study critiquing *all-day* kindergarten research for methodological limitations and general weaknesses, Puleo (1988) reported no quantitative evidence supporting significant differences regarding effects on social, emotional, and developmental factors. However, a range of anecdotal accounts of the benefits of *all-day* programming existed. Stinard (1982) found that in 33 comparisons of academic achievement of kindergarten children involved in eight studies, 85% favored *all-day* kindergarten programming, none favored *half-day* programming, and 15% of the studies reported no differences between the two groups. Karweit (1987) used a "best-evidence synthesis" technique to categorize existing kindergarten programming research by each study's methodological rigor. She found that although under-achieving and disadvantaged students benefited from receiving the additional instruction provided by *all-day* schedules, the benefits were found to be short-term measures with no demonstrated long-term effects. Gullo et al. (1986) conducted a study of 216 students to compare the relative effects of three different kindergarten schedules on children's end-of-year achievement and prosocial classroom behaviors. No significant differences were found among the three groups on a test of entry level development. At the end of the year, the children in the *all-day* kindergarten schedule scored significantly higher than either of the other two groups on the total score of the Metropolitan Reading Readiness Test. Nieman and Gastright (1975) conducted a longitudinal study comparing the effects of preschool and *all-day* kindergarten experience with preschool and *half-day* kindergarten experience on children's academic performance. The children with preschool and *all-day* kindergarten backgrounds scored significantly higher on achievement measures, with these differences being maintained through the second grade.

Research Favoring No Differences in Kindergarten Programs

In the literature, four studies reported no significant differences in achievement between children attending *half-day* and *alternate-day* kindergarten programs. Gullo (1990) reported no significant differences between teachers' ability to assess children's end-of-year achievement in *half-day* and *all-day* schedules when comparing all three types of kindergarten programming. Mouw (1976) reported no significant differences between *half-day* and *alternate-day* groups using The Cognitive Abilities Test to compare academic performance. Ulrey et al. (1982) used a control-comparison design to investigate school performance and parent satisfaction. No significant differences in achievement and behavior between the groups were found. However, parental dissatisfaction appeared to increase in the *alternate-day* program. Gullo and Clements (1984) found no significant differences between *half-day* and *alternate-day* kindergarten groups on achievement variables using the Metropolitan Reading Readiness Test.

Summary of Previous Research

Kindergarten programming research to date contains a number of weaknesses. Few studies contained pretest measures to establish differences in children's entry level development. The use of random selection of children from a variety of settings to account for teacher, curriculum, school, cultural, or individual differences was not evident. All studies to date used group achievement testing to measure academic performance of kindergarten students. Many of the comparison studies were done across school districts without regard to a common kindergarten curriculum or use of developmentally appropriate classroom practices. Finally, only one other study has utilized a comparison of the relative effects of all three different kindergarten

schedules on both children's academic and social competence (Gullo et al., 1986) without extrapolating from other studies.

The present study was designed to counteract the limitations found in the existing research in the following ways: (a) all three types of kindergarten programming were directly compared on the same variables; (b) pretest procedures were used to determine children's entry level development; (c) individual standardized tests were administered in a risk-free environment for young children; (d) individual assessment measures were used in reading, writing, and math; (e) classroom prosocial behaviors were assessed by kindergarten teachers who were well acquainted with the social competence of their students using a standardized rating scale; (f) anecdotal data were collected to triangulate formal assessment measures.

Method

Subjects

A midwest, primarily middle-class school district, located in a city of 25,000 population, in collaboration with a nearby university conducted a research project designed to compare the relative effects of three different kindergarten schedules on children's academic and social competence. Subjects for this study were the entire 1992-93 kindergarten classes from three schools within the district. Forty-seven children (29 males, 18 females) attended the *all-day* schedule taught by two teachers in adjacent classrooms. Forty-four children (24 males, 20 females) attended the *half-day* schedule taught by the same teacher in morning and afternoon sessions. Fifty-six children (31 males, 25 females) attended the *alternate-day* schedule identified as Monday/Wednesday/Friday and Tuesday/Thursday/Friday groups taught by two teachers teaming in one large instructional area. The mean ages of the *all-day, half-day,* and *alternate-day* groups were 5.7 years, 5.7 years, and 5.9 years, respectively. The three kindergarten groups had the following similarities: (a) a common kindergarten curriculum in use for more than two years; (b) the teachers represented similar levels of college education, years of experience, and district staff development training; (c) a representative sampling of middle to lower class students from one and two-parent homes; and (d) all sites qualified for assistance according to Chapter 1 Reading guidelines.

Procedure and Instruments

To control for nonrandom assignment of subjects, a quasi-experimental design was used with pretests and posttests administered to all kindergarten children enrolled in three elementary school sites within one unified district. Each elementary school represented one of three different kindergarten schedules– *all-day*, everyday; everyday, *half-day*; or *all-day*, alternate-day. Analysis of covariance for reading, math, and writing was performed using chronological age and pretest scores as covariates to statistically reduce effects of initial group differences.

Each kindergarten student was individually administered the Test of Early Reading Ability-2 (TERA-2) (Reid, Hresko, & Hammill, 1989) in October (pretest) and April (posttest). The TERA-2 is a norm-referenced test designed to assess children's ability to attribute meaning to printed symbols, their knowledge of the alphabet and its function, and their understanding of the conventions of print. It contains two equivalent forms appropriate for children ages 3 through 9 years.

All students were individually administered the Test of Early Mathematics Ability (TEMA) (Ginsburg & Baroody, 1990) in a pre-posttest procedure in October and April. The TEMA is a norm-referenced, untimed test designed to measure a child's informal mathematics in the areas: (a) concepts of relative magnitude; (b) counting skills; and (c) calculation skills. The TEMA items are contained in an examiner's book using both pictures and manipulatives to conduct assessment probes providing insight into children's mathematical ability. The instrument is normed for ages 3 through 9 years.

In April, the kindergarten teachers were asked to rate their perceptions of the children's social competence using the Hahnemann Elementary Behavior Rating Scale (HEBS) (Spivak & Swift, 1975). The HEBS is a 60-item instrument designed to provide a standard system for identifying and measuring classroom behaviors of elementary school children that interfere with, facilitate, or reflect their ability to cope with academic expectations. Each of 14 behavior dimensions or factors for regular and open classes is defined by three, four, or five items. The behavior items defining each factor are grouped together on the Student Profile to aid understanding. Factors are specifically arranged in order from 1 to 14 to indicate: (a) the factors relevant to both regular and open classrooms (1-10); (b) those appropriate only to the open setting (11-12); and (c) those appropriate only to the regular setting (13-14). Attentiveness and academic achievement are included in the scale to round out the picture of the child's total classroom performance. Teachers rate students on each item on a scale of 1 to 5 or 1 to 7, dependent upon the item. Each kindergarten student's total score is the total of the ratings among the items comprising the factor. The score is an indication of how much of that factor the child is perceived as having. Therefore, the higher the score, the more of that factor the kindergarten teacher judged that child as exhibiting in their classroom behaviors. The following is a brief description of the factors and the number of items rated within each factor. Factor 1, *originality* (four items), active curiosity and imagination displayed by the child. Factor 2, *independent learning* (five items), the degree to which students can think for themselves. Factor 3, *involvement* (five items), the

willingness children display to integrate personal and classroom experiences. Factor 4, *productive with peers* (three items), children's ability to react positively and work well with others. Factor 5, *intellectual dependency with peers* (four items), the extent to which children are influenced by what peers think and depend upon them for direction. Factor 6, *failure anxiety* (five items), the level of apprehension about failing. Factor 7, *unreflectiveness* (three items), the degree of cognitive impulsivity. Factor 8, *irrelevant talk* (four items), the extent to which children make inappropriate remarks. Factor 9, *disruptive social involvement* (four items), the tendency to become over-stimulated in social activity. Factor 10, *negative feelings* (five items), the degree to which feelings such as helplessness or criticism of others are exhibited in the learning environment. Factor 11, *holding back/withdrawn* (five items), the extent to which children are unwilling to participate in classroom activity. Factor 12, *critical-competitive* (four items), the level of domination of peers and competitiveness displayed. Factor 13, *blaming* (four items), the level to which children perceive external circumstances and others' actions to influence their own successes or failures. Factor 14, *approach to teacher* (four items), the extent to which children rely on the teacher for support. Factor 15, *added items* (*inattention and academic achievement*) (three items), limitations of attentiveness and overall academic expectation.

All students were individually administered the Concepts of Writing, an informal assessment, in October and April. The 10-item writing questionnaire is designed to survey children's ability to construct meaning using alphabetic symbols. Writing samples were rated using a 9-point holistic scoring guide containing the following stages of developmental writing: (a) produced mainly pictures; (b) produced letter-like forms (scribbling); (c) produced random letters (ABC's); (d) wrote own names correctly; (e) wrote names of family members and friends and/or environmental print items; (f) wrote one word (other than own name) using invented spelling; (g) wrote single, nonenvironmental print, correctly spelled word; (h) wrote multiple random unfamiliar words using conventional and/or invented spelling; (i) wrote sentence-like response.

During the spring, observations in kindergarten classrooms were made by an early childhood rater trained to assess the level of use of developmentally appropriate practices using the Developmentally Appropriate Practice (DAP), a 16-item rating scale derived from the Nebraska Kindergarten Position Paper (1984) and consistent with the views of the National Association for the Education of Young Children (Bredekamp, 1987). The informal instrument is designed to tap the curricular emphasis and emotional climate of kindergarten programs. Each of 16 factors is clearly defined and rated on a 9-point continuum ranging from "appropriate practices" to "inappropriate practices" (see Figure 1). Factors comprising the DAP include: (a) learning environment; (b) child centeredness; (c) thinking, reasoning, and deciding; (d) science and nature; (e) mathematics; (f) physical development; (g) emergent literacy; (h) literacy experiences integrated throughout the curriculum; (i) creativity–artistic expression; (j) creativity–musical experiences; (k) concrete experiences which value individual differences; (l) home-school relations; (m) readiness-school entry policies; (n) readiness-individual differences respected; (o) assessment; (p) diversity–anti-bias perspective. The scores on the 16 individual factors are summed for a total raw score. The highest possible score on the DAP is 64 points.

Figure 1: DAP Scoring Continuum

Figure 1: DAP Scoring Continuum

At the March parent-teacher conference, kindergarten teachers explained and distributed the Family Reading Inventory to survey parents' participation in their children's literacy development. The 14-item questionnaire provided data concerning reading habits and materials in the home, educational and occupational background of parents, and children's previous childcare experiences.

Each kindergarten teacher's theoretical orientation to reading instruction was surveyed using the DeFord (1985) Theoretical Orientation to Reading Profile (TORP). The TORP utilizes a Likert-type scale response to 28 statements about reading to classify teacher beliefs about reading instruction into phonics, skills, or whole language categories. (see Figure 2)

Figure 2: TORP Scores and Categories

Results

In this study, kindergarten classes grouped as *all-day, alternate-day,* and *half-day* were given pretests during October and posttests during April. Analysis of covariance (ANCOVA) for reading, math, and writing was used to determine differences between groups, with pretest scores and chronological age as covariates. No significant differences were found for math or writing post tests. However, significant differences for group means were found for reading raw score ($p < .014$), reading NCE ($p < .023$), and reading percentile ($p < .050$). Table 1 presents the means and standard deviations of the three groups' scores. Differences on TERA raw score were found between *all-day* ($\bar{X} = 22.87$) and *half-day* ($\bar{X} = 20.24$) and between *alternate-day* ($\bar{X} = 22.07$) and *half-day* ($\bar{X} = 20.24$); on TERA NCE between *all-day* ($\bar{X} = 49.17$) and *half-day* ($\bar{X} = 40.94$) and between *alternate-day* ($\bar{X} = 46.33$) and *half-day* ($\bar{X} = 40.94$); on TERA percentile between *all-day* ($\bar{X} = 50.15$) and *half-day* ($\bar{X} = 39.96$)

Post hoc analyses using *t*-tests indicated significant differences in reading between *all-day* and *half-day* groups. Nonsignificant differences were found between *all-day* and *alternate-day* and between *alternate-day* and *half-day* schedules. The significant and nonsignificant differences between groups on reading percentile scores are presented in Table 2.

Multivariate analysis of covariance for the 14 subscales of behavior on the Hahnemann Elementary School Behavior Rating Scale showed significant differences between groups. Age was used as a covariate. Table 3 presents the means and standard deviations of the students' HEBS scores. Analysis was performed on factors relevant to both regular and open classrooms (1-10), those appropriate only to the regular setting (13-14), and the two added factors of attentiveness and academic achievement for a total of 14 HEBS scales. The factors are independent and thus can be used singly (Spivak & Swift, 1975).

As seen in Table 3, a significant main effect for schedule was found for *originality, independent learning, involvement, productive with peers, intellectual dependency, failure anxiety, approach to teacher, inattention,* and *academic achievement*. Post hoc analyses using the Newman-Keuls procedure indicated children attending *half-day* programming scored significantly higher on all four factors considered to facilitate learning (originality, independent learning, involvement, and productive with peers). The *alternate-day* group scored significantly lower on all four factors considered to facilitate learning. There were no significant differences between the three groups on four of the six factors considered to interfere with learning (unreflectiveness, irrelevant talk, social over involvement, negative feelings). There were significant differences on two factors (intellectual dependency and failure anxiety) from that group. The *half-day* and *all-day* groups had lower scores indicating less evidence of such classroom behaviors. On the four factors (blaming, approach to teacher, inattention, and academic expectation) considered to show a child's ability to cope with academic expec-

Table 1

Test of Early Reading Ability, Test of Early Mathematics Ability, and Concepts of Writing Scores for Children Attending *All-Day*, *Alternate-Day*, and *Half-Day* Kindergartens

		Age		Pretest		Posttest		Adj. Posttest		
	N	Mean	Std.	Mean	Std.	Mean	Std.	Mean	F	P
Reading Raw Score									4.37	.014*
All Day	47	5.7	0.4	11.6	5.1	21.7	6.3	22.9		
Alternate Day	56	5.9	0.5	12.3	5.8	21.4	6.1	22.1		
Half Day	44	5.7	0.5	15.8	5.6	22.3	5.2	20.2		
Reading NCE									3.86	.023*
All Day	47	5.7	0.4	27.7	19.3	47.5	20.5	49.2		
Alternate Day	56	5.9	0.5	28.7	21.7	42.8	21.9	46.3		
Half Day	44	5.7	0.5	42.6	21.9	47.2	21.5	40.9		
Reading Percentile									3.05	.050*
All Day	47	5.7	0.4	21.6	23.7	47.8	29.2	50.1		

	Alternate Day	56	5.9	0.5	24.4	26.2	41.6	28.4	46.4	
	Half Day	44	5.7	0.5	42.1	30.9	48.5	30.9	40.0	
Math Raw Score										0.48 .619
	All Day	47	5.7	0.4	15.3	7.3	23.0	7.6	24.3	
	Alternate Day	56	5.9	0.5	17.0	8.1	25.1	7.8	25.1	
	Half Day	44	5.8	0.5	18.7	6.8	25.8	7.0	24.4	
Math NCE										2.50 086
	All Day	47	5.7	0.4	40.2	28.7	40.6	27.8	40.3	
	Alternate Day	56	5.9	0.5	41.0	29.8	43.4	27.0	44.2	
	Half Day	44	5.8	0.5	46.2	27.7	53.4	27.9	52.6	
Math Percentile										0.11 .895
	All Day	47	5.7	0.4	16.5	15.2	30.0	23.0	34.3	
	Alternate Day	56	5.9	0.5	21.6	23.0	35.0	27.8	36.0	
	Half Day	44	5.7	0.5	28.6	25.3	40.5	31.0	34.6	
Writing Raw Score										2.40 .095
	All Day	47	5.7	0.4	3.5	1.2	4.3	1.5	4.3	
	Alternate Day	56	5.9	0.5	3.6	1.2	4.8	1.4	4.8	
	Half Day	44	5.7	0.5	3.6	1.2	4.8	1.4	4.8	

*$p < .05$ ** $p < .001$.

Table 2

t-Test Percentile Comparisons Between Three Kindergarten Schedules on Test of Early Reading Ability (TERA-2)

	All-Day	Half-Day
Half-Day	2.45	
	.01*	
Alternate-Day	1.00	1.63
	.32	.10

* $p < .05$ ** $p < .001$

Table 3

Hahnemann Elementary School Behavior Rating Scale Scores for Children Attending All-Day, Alternate-Day, and Half-Day Kindergarten Schedule

	N	Mean	SD	F	P
Originality					
All-day	47	11.4	4.0	42.08	.0001
Alternate-day	56	8.0	3.3		
Half-day	44	14.5	3.4		
Independent Learning (33)					
All-day	47	21.6	6.2	9.09	.0002
Alternate-day	56	20.8	5.8		
Half-day	44	25.6	5.7		
Involvement (27)					
All-day	47	16.4	5.0	31.41	.0001
Alternate-day	56	14.0	4.4		
Half-day	44	21.1	3.8		
Productive With Peers (21)					
All-day	47	12.4	4.3	9.81	.0001
Alternate-day	56	13.5	3.0		
Half-day	44	15.8	3.7		
Intellectual Dependency (24)					
All-day	47	10.9	4.8	6.26	.0025
Alternate-day	56	14.0	4.2		

Half-day	44	12.5	4.4		
Failure Anxiety(29)					
All-day	47	11.8	4.8	10.97	.0001
Alternate-day	56	13.5	4.3		
Half-day	44	9.5	3.6		
Unreflectiveness (17)					
All-day	47	7.4	3.2	0.28	.7569 NS
Alternate-day	56	7.2	2.8		
Half-day	44	7.0	2.5		
Irrelevant Talk (20)					
All-day	47	8.1	3.7	1.71	.1849 NS
Alternate-day	56	9.4	3.3		
Half-day	44	8.5	4.1		
Social (Over) Involvement (22)					
All-day	47	10.1	5.0	2.07	.1294 NS
Alternate-day	56	11.9	4.3		
Half-day	44	11.2	4.8		
Negative Feelings (27)*					
All-day	47	9.2	4.5	2.87	.0602 NS
Alternate-day	56	7.2	3.4		
Half-day	44	7.8	4.5		

(Table continues)

Table 3 (Con't)

Hahnemann Elementary School Behavior Rating Scale Scores for Children Attending All-Day, Alternate-Day, and Half-Day Kindergarten Schedule

Blaming (24)					
All-day	47	8.2	4.0	1.82	.1654 NS
Alternate-day	56	7.6	3.5		
Half-day	44	6.8	3.1		
Approach to Teacher (24)					
All-day	47	15.2	4.4	31.03	.0001
Alternate-day	56	12.1	3.0		
Half-day	44	18.3	4.3		
Inattention (10)					
All-day	47	5.2	2.3	8.56	.0003
Alternate-day	56	6.1	2.6		
Half-day	44	4.0	2.3		
Academic Expectation (7)					
All-day	47	4.5	1.7	4.70	.0105
Alternate-day	56	4.8	1.4		
Half-day	44	5.5	1.5		
Age (Covariate)					
All-day	47	6.2	0.4		
Alternate-day	56	6.3	0.5		
Half-day	44	6.2	0.5		

*Maximum Score Possible

tations, three revealed significant differences between groups. There were no significant differences between group scores on the Factor 11 (blaming). On Factor 12 (approach to teacher), the *half-day* had a high positive score, the *all-day* the median score, while *alternate-day* children were the least likely to voluntarily approach the teacher. On Factor 13, the *half-day* group exhibited the least amount of inattentive classroom behaviors while the *alternate-day* and *all-day* scored equally. Academic expectation (factor 14) revealed significant differences between the *half-day* group and the *alternate-day* and *all-day* groups. The academic expectation level was significantly higher for the *half-day* kindergarten schedule.

According to the Theoretical Orientation to Reading Profile (TORP), a self-report instrument measuring theoretical orientation to reading instruction, the two kindergarten teachers from the *alternate-day* schedule considered themselves to be whole language teachers with raw scores 111 and 116. The two teachers of the *all-day* schedule and the teacher of the *half-day* schedule held a skills (traditional/basal reader) orientation with scores of 80, 94, and 105, respectively.

The Developmentally Appropriate Practice (DAP), an informal observational rating scale, indicated the *alternate-day* kindergarten schedule provided the highest level of developmentally appropriate practices ($x = 19$). The *all-day* schedule was next ($x = 5$). The *half-day* schedule was found to provide the least developmentally appropriate learning environment ($x = -6$).

The parent survey distributed by the kindergarten teachers at the spring parent-teacher conferences resulted in a 77% return. The data are summarized in family literacy profiles:

1. Those families that reported having more children's books available at home tended to spend more time reading and less time watching television.

2. In the homes in which the fathers did not like to read, there tended to be fewer children's books and less time spent reading to the children. Fathers who indicated that they preferred reading books or had to read on a regular basis for work, school, or other daily uses tended to spend more time reading to their children on a regular basis.

3. Parents who read magazines and newspapers on a regular basis were more apt to be seen reading to their children. Whereas, there did not appear to be a similar relationship if either parent preferred to read books.

4. Only two factors related specifically to the mother were found in this survey. The results indicated that the educational level of the mother was related to the number of children's books that were available and the amount of time spent reading to their children.

Analysis of covariance for children's reading achievement from homes with fathers who were high school graduates versus fathers who were not high school graduates was performed on the survey data. Students whose fathers were high school graduates performed significantly higher on the TERA posttest raw score ($F, 47.43$; $p < .0001$). Analysis of covariance for children's reading achievement from homes with mothers who were high school graduates versus mothers who were not high school graduates was performed. Students whose mothers were high school graduates performed significantly higher on the TERA posttest raw score ($F, 53.17$; $p < .0001$). Table 4 presents correlation findings of selected parent survey responses and kindergarten teachers' ratings of achievement for TERA posttest raw scores, TEMA posttest raw scores, and writing posttest raw scores. Only the correlations of kindergarten teachers' ratings of achievement had significant correlation with children's reading and math, achievement levels ($p < .0001$). Of interest are the positive correlations of mother full time in the home and Head Start toward academic achievement. Negative correlations were found between early child care and preschool experiences and academic achievement of kindergarten students.

Discussion

Contrary to expectations, the quality of the learning environment was not as significant as the quantity of time kindergarten children spent at school in determining academic differences between groups. Analysis of covariance showed the *all-day* kindergarten group scored

Table 4

Correlation Coefficients of Selected Parent Survey Responses and Kindergarten Teachers' Ratings of Achievement for TERA Posttest Raw Scores, TEMA Posttest Raw Scores, and Writing Posttest Raw Scores

		Kindergartners' Experience with Child Care and Early Education						Kindergarten
	Mother Full-time Home Maker	Child Care Birth to 2 yrs.	Child Care 3-4 yrs.	Currently Before/ After School	Early Education 3 yr. Preschool	Early Education 4 yr. Preschool	Head Start	Teachers' Ratings of Achievements
TERA	.16	.22	.12	-.08	-.14	.02	.23	.61
TEMA	.07	-.08	-.01	-.08	-.05	-.06	.24	.72
Writing	.18	-.18	-.26	-.12	-.19	-.08	.22	.45

significantly higher in reading with nonsignificant differences in math and writing. The evidence suggests that young children benefit from additional time to engage in various experiences with alphabetic text symbols while in the process of constructing their own understandings of written language.

An important aspect of this study was to apply qualitative methodology to realistically portray the normal, everyday context of the three different kindergarten learning environments. Qualitative techniques provided a lens to view teacher beliefs and actual classroom practices in a school district which had earlier adopted a developmental kindergarten curriculum based on the complementary trends of process-oriented mathematics, whole language philosophy, and developmentally appropriate practices for young children. Observational and survey evidence suggested primarily academically oriented learning environments administered by five veteran kindergarten teachers, three of whom had measured "skills" on the orientation to reading instruction survey instrument (TORP) and two marginally rating as "whole language" teachers. Notable was the lack of conclusive use of developmentally appropriate practices in any of the three kindergarten programs as measured by an observational instrument based on the Guidelines for Developmentally Appropriate Practice of the National Association for the Education of Young Children (NAEYC). Children were more often observed in traditional, skills-driven kindergarten activities than interactively engaged in child-centered learning, making choices, building with blocks or other manipulatives, and doing project work.

The nonsignificant differences between *all-day* and *alternate-day* groups in reading achievement indicated that the learning which occurs in more abbreviated, yet marginally developmentally appropriate early childhood programs facilitated by teachers changing to whole language philosophical practices is comparable to the achievement level of children attending "all-day, every-day" schedules. This presents the tantalizing suggestion that the debate shift from length of the kindergarten day to quality of the program and intensive staff development for teachers. As Spodek (1986) and Hyson, Hirsh-Pasek, and Rescorla (1990) have recommended, the concept of developmental appropriateness also needs to be coupled with cultural values and community expectations in order to make decisions about best educational experiences for young children.

The first major question addressed by this study was whether different kindergarten schedules produced different levels of achievement in reading, math, and writing at the end of the year as evidenced by child-centered, individually administered assessments. The findings indicated no significant differences between groups in math and writing. Children in *all-day* schedules scored significantly higher on reading raw score, reading NCE, and reading percentile on the Test of Early Reading Ability-2 (TERA-2). This finding was consistent with the findings of Gullo et al. (1986) in comparing academic achievement between three different kindergarten schedules using the Metropolitan Reading Readiness Test. Post-hoc analyses revealed significant differences between *all-day* and *half-day* on reading percentile, reading raw score, and reading NCE scores. There were nonsignificant differences between *all-day* and *alternate-day* and between *alternate-day* and *half-day* on reading percentile scores. This supported other research indicating the lack of superiority of *half-day* schedules over other schedules (Gullo et al., 1986). It supported other research generally showing *alternate-day* programming to be at least as academically effective as *half-day* schedules (Cleminshaw & Guidubaldi, 1979; Gomowich, Volker, & Landry, 1974; Gullo et al., 1986; Gullo & Clements, 1984; Minnesota State Department of Education, 1972; Mouw, 1976; Schulz, 1981; Smith, 1980; Ulrey et al., 1982).

The second major question addressed in the study concerned the prosocial classroom behaviors exhibited by children in each of the three kindergarten schedules as rated by kindergarten teachers at the end of the academic year. Multivariate

analysis of covariance for the 14 subscales of the Hahnemann Elementary School Behavior Rating Scale (HESB) showed significant differences between groups. Age was used as a covariate. The *half-day* children were rated significantly higher than the *all-day* and *alternate-day* groups on nine of the HESB factors: originality, independent learning, involvement, productive with peers, intellectual dependency, failure anxiety, approach to teacher, inattention, and academic achievement. On the four factors that facilitate learning (originality, independent learning, involvement, and productive with peers), the *half-day* group was rated significantly higher, indicating the children were perceived by the teachers as exhibiting more of those behaviors in the classroom. On two of the six factors that interfere with learning (intellectual dependency and failure anxiety), the *half-day* kindergarten children were rated significantly lower, indicating fewer of those behaviors demonstrated in the classroom. Three (approach to teacher, inattention, and academic achievement) of the four factors measuring children's ability to cope with academic expectations of the classroom were scored significantly in favor of the *half-day* groups.

The data implied that children in *half-day* kindergarten schedules exhibit greater prosocial competence and fewer negative classroom behaviors than children from *all-day* and *alternate-day* programs. This negated the findings of Gullo et al. (1986) reporting that children in *alternate-day* kindergarten programs were rated significantly lower by their teachers on negative social behaviors and higher on prosocial behaviors. It also contradicted Gullo and Clements' (1984) earlier findings that revealed no significant differences on the HESB between children attending *alternate-day* and *half-day* kindergarten programs. It suggested the need for further consideration of children's prosocial classroom behaviors and how kindergarten teachers perceive those behaviors. This finding implied a consequence of the academically-oriented kindergarten curriculum in its effect on children's attitudes toward learning. When young children are introduced to formal instruction too early, in a form that is too abstract, they may learn the knowledge and skills presented, but at the expense of the disposition to use them.

An important consideration in the present empirical evidence regarding teachers' ratings of classroom social behaviors is the positive correlation (see Table 4) between children's achievement levels in reading and math as measured by the TERA-2 and TEMA and the kindergarten teachers' perceptions of the children's academic levels as reported on the HESB (Factor 14, Academic Achievement). The correlation findings for reading and math ($r = .61$ and .72, respectively) supported teachers' ability to accurately judge the behaviors of young children. This finding suggested the use of teacher rating scales as accurate indicators of children's behaviors as perceived by professional educators trained to work with young children.

Research has demonstrated that parents have a strong influence on the literacy development of their children. Self-report data from the parent survey suggested that parents are aware of the importance of making children's literature available in the home, reading to children, modeling reading by affording opportunities for children to see them read a variety of text materials, limiting television viewing, and seeking at least high school diplomas themselves. Parents documented differences between genders regarding levels of education, with mothers reporting a higher level of some college/trade school experience (40%) than fathers (27%). Analysis of covariance on children's reading achievement scores revealed a significant difference if the father was a high school graduate as well as if the mother was a high school graduate. Correlation evidence indicated there is a positive relationship between children's academic achievement and mothers being full-time homemakers.

Although mothers have traditionally been viewed as the major providers of literacy experiences in the home, fathers were found to play key roles in a variety of ways. The two factors relating directly to mothers in the study involved the educational level of the mother and the relationship of number of children's books in the home and amount of time spent reading to the children. If the father did not like to read, there tended to be fewer books in the home and less time spent reading to children. Whereas, if the father preferred to read either for pleasure or job-related reasons, there tended to be more time spent reading to children. The parent literacy profiles punctuated the need to involve parents as important partners in children's literacy development. Maxim (1993) recommended "teachers must effectively involve families and be totally committed to the concept that the school and family work together in meeting the emerging developmental needs of all children" (p. 509).

Caregiver training is potentially one of the most important quality issues facing the field of early childhood education today. Trained professionals in programs such as Head Start have demonstrated differences in caregivers' behaviors as a function of professional preparation. An important finding from this study was the negative correlation between early child care experiences and preschool experiences with kindergarten children's academic achievement (see Table 4). Head Start provided a positive correlation with children's early academic achievement. This study supported the current research (Caldwell, 1986; Day, 1988; Gullo, 1990) establishing that at an early age education and care are inseparable and that for either to be relevant to the needs of children and families, both components must be present. It adds further evidence that training of caregivers at the college level can make an important difference in children's day care experiences (Dunn,

1993).

Finally, in addition to examining differences in achievement related to schedule it had been hoped to find differences by types of curriculum (i.e., skill-driven versus developmentally appropriate). However, these differences were not found because of the non-experimental setting of the study. The research findings did identify previously unrecognized patterns in the data collected in classrooms, homes, and from the teachers. Such evidence suggested that the quality of time children spend in school is not the only essential element to be considered in kindergarten programming.

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